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RESEARCH PAPER

Equitable regulation of private forests

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Abstract The sustainability of forested ecosystems often requires cross-boundary management at large spatial scales. This can be challenging, however, in landscapes where forests are primarily under small-scale, private ownership. Consequently, in many areas of the world private forest practices are governmentally regulated to promote more consistent cross-boundary outcomes and better protection of large-scale ecological integrity. In this qualitative, 'grounded theory' study, 109 stakeholders throughout the State of Washington, USA were interviewed to learn their perspectives about processes and effects of private forest regulation. The State of Washington is widely recognized for its long-established and comprehensive forest regulatory policies and thus provides an excellent study area for this topic. Interviewees included private forest owners, forest policy advisors, regulatory agency employees, and representatives from forest ownership organizations, forest industry trade groups, and environmental organizations. The study revealed an important and often poorly recognized outcome of private forest regulatory policy: regulation rarely affects all private forest owners similarly. Instead, the burdens and advantages of

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regulation tend to be unevenly distributed within this key stakeholder group. The study identified three phenomena producing these inequitable outcomes: natural landscape variability, oversights in policy design, and disparate interests and goals among forest owners. This paper analyzes these causes, identifies solution pathways, and discusses implications for policy-makers.

Keywords Non-industrial forestry · Regulatory impacts · Grounded theory · Situational mapping · Environmental ethics

Introduction

Worldwide, there is increasing interest in governmentally regulating private forests (Teeter et al. 2003). This poses social, legal and political challenges even more complex than those associated with the regulation of public forests, because on private forests the public right to a healthy environment must be blended with the individual rights of the forest property owners (Kilgore 2004).

In the USA, forest land may be privately owned by individuals or companies, but the natural resources on that land are subject to an increasingly complicated network of regulations intended to protect public interests and rights related to those resources. Forest owners have the right to restrict or prevent physical access to the land by the public for recreational or other personal use, but are required to provide substantial consideration to the public in other important ways. For example, all wildlife and fisheries in the USA are considered a public resource owned by the states. Private forest owners own the habitat that occurs upon their land, but not the animals. Consequently, there are numerous regulations requiring forest owners to protect wildlife, fish and related habitats. Forestland owners are also obligated to abide by state and federal laws pertaining to protection of air and water quality. Fossil fuel and mineral rights are sometimes held by the forestland owner, but in many instances are owned by another private party or a governmental entity and the forest owner is obligated to cooperate with the extraction of those resources. Forestland owners own the timber on their land, but in many locales are subject to a variety of regulations pertaining to how that timber is managed and how much of it may be harvested.

Primary responsibility for the regulation of private forest management practices in the USA rests with the individual states; therefore most laws and rules pertaining to forest harvest and reforestation are formulated and enforced at the state level. Related resources including air, water and threatened and endangered species are additionally subject to overarching federal regulations. Beginning in the mid-1900s, many states, including Washington, became more proactive about regulating private forests to reverse localized trends of resource degradation and thereby avoid new and more restrictive federal rules (Dana and Fairfax 1980). To accomplish these goals, the states have employed diverse strategies ranging from voluntary education programs to strictly enforced command-and-control forest practice rules, depending upon local needs and social expectations. Consequently, there is little consistency in the structure or scope of regulation (Kilgore et al. 2003).

A similar lack of standardized policy may be observed in many other regions worldwide. The learning curve for policy-makers is correspondingly steep, because there is little broadly-tested precedent to guide them. To help shed light on this complicated issue, this study examines how regulatory outcomes are perceived by a knowledgeable group of forest stakeholders directly involved in designing, administering and implementing a comprehensive forest policy system in the State of Washington, USA.

Related Literature

Within the USA, large-spatial-scale, cross-boundary ecosystem management is widely conceded to be ecologically important (Kohm and Franklin 1997; Kimmins 1997) but significant and continued social challenges can be expected (Belin et al. 2005; Blomquist and Schlager 2005). When regulating private forests, a public asserts a right to expect particular outcomes from private landowners (Singer 2000; Schelhas 2003). Relevant public and private rights, however, are often poorly defined and integrated (Ostermeier and Keele 2003). Courts within the USA have taken a fragmented approach toward cases testing public versus private environmental rights. There is little consistent legal precedent to guide policy-makers in developing socially sustainable regulation (Meltz et al. 1999).

Regulatory systems and institutions are inherently complex. When their interrelated components fail to work synergistically the systems may become functionally ineffectual. They may fail to fit the problem they are intended to address, match the scale of the issue or setting, or interlink appropriately with related policy systems and institutions (Young 2002). Furthermore, throughout the world, political systems and property lines are typically founded upon arbitrary legal boundaries rather than natural ecosystem boundaries. Blending them can be difficult (O'Leary et al. 1999). Regulation can produce many positive environmental outcomes for both the public and the private landowners, but without foresighted policy design the social burden for achieving those outcomes may fall disproportionately upon the landowners (Meltz et al. 1999).

The property rights associated with the ownership of land and its related natural resources are among the most hotly debated and regionally differentiated issues pertaining to environmental management (Meltz et al. 1999). History has clearly demonstrated that there is nothing inherently permanent or transitory about these rights. They are framed within the changing goals and expectations of a society. The bundle of rights associated with land ownership is often metaphorically described as a 'bundle of sticks'. A society adds or subtracts 'sticks' from a private landowner's 'bundle' in response to shifting cultural paradigms (McCay 1996). Changing environmental conditions and emerging scientific knowledge can also lead societies to reexamine their former concepts of ownership and entitlement to better achieve long-term, socially equitable environmental protection (Hanna et al. 1996; Geisler and Daneker 2000). The State of Washington has succeeded in instituting rigorous private forest management standards without needing to modify established conventions pertaining to ownership of the land base, but the bundle of public

'access', 'withdrawal' and 'collective choice' rights pertaining to the natural resources that occur on private land are clearly undergoing continual social reassessment (Ostrom and Schlager 1996). This is evidenced by the State's increasingly comprehensive regulations, which embody McKean's conclusion that 'it is appropriate to think of forests as a complex of many commodities with attributes of both common-pool and public goods' (Gibson et al. 2000, p. 7).

Few authors have focused on the fact that a forest regulation may produce individually unequal regulatory outcomes among forest owners. With the exception of the work of Zobrist et al. on the effects of Washington's riparian regulations (Zobrist et al. 2004; Zobrist and Lippke 2003), this study is believed to be among the first peer reviewed research on this topic in the USA. There is, however, a body of literature that describes how the diverse personal circumstances of private forest owners may induce dissimilar *non-regulatory* outcomes among them. For example, private forest owners have a broad range of personal backgrounds, and these affect their management goals and outcomes (Blatner and Greene 1989; Birch 1996; Butler and Leatherberry 2004). Bliss (1988, 2003) found that Wisconsin's forest owners generally chose their management goals based upon personal interests rather than external influences such as foresters, forest tax laws or cost-sharing programs. Finley et al. (2006), p. 10 found a strong association between interest in cross-boundary cooperation and profiling variables including age, affluence, personal values, and attitudes of forest owners. This study found that these types of differences in personal circumstances, backgrounds and management goals can also factor into a forest owner's *regulatory* outcomes. In other words, the degree to which a landowner is affected by a particular regulation is linked in part to the unique physiography of that owner's forest land, and to the owner's goals and objectives.

Research Method

The study area included the entire State of Washington, which is located in the uppermost northwestern corner of the United States and is famous for its highly productive, temperate, primarily coniferous forests. Private forests comprise approximately 42% of the state's 22 M ac (8.9 M ha) of forestland, and are integral to its culture and economy. Approximately 31% of the private forestland is 'industrial' and 69% is 'non-industrial'. 'Industrial' forests may be defined as those owned by large-scale businesses that rely upon their forests as a primary or sole source of income. 'Non-industrial' forests, by contrast, are owned by private individuals, families or other small ownership groups, often for purposes other than income from timber management. Some non-industrial owners harvest timber from their forests for profit, but most own their forestland for other reasons such as recreation, hunting, or as a homesite (Butler and Leatherberry 2004). The industrial forestry sector in the State of Washington comprises about 60 companies. The non-industrial owners number over 90,000 (WA-DNR 2001; Erickson and Rinehart 2005.)

In 1946, Washington became the first state in the USA to regulate private forests. It has remained in the vanguard of policy innovation, developing an unusually

collaborative and comprehensive policy system (Creighton and Baumgartner 2005; Smith 1997). Because of this system's combined elements of broad scope, long duration, collaboration and innovation, its stakeholders are unusually experienced with forest regulatory processes and outcomes. Consequently, Washington comprised an excellent 'field laboratory' for this study.

The study employed the qualitative *grounded theory* research method (described by Glaser and Strauss 1999; Clarke 2005). Although qualitative study results are not suitable for statistical analysis, they enable the development of a richer and more fully-developed understanding of the study subject than can be obtained through quantitative surveys because the study participants discuss the study subject in depth. Data are collected through in-depth personal interviews. Analytical insights and new theory emerge inductively through the data, in contrast to deductive studies wherein data are tested against previous theories and predetermined hypotheses. The pool of interviewees is selected purposively rather than randomly or statistically, and is designed to capture the full diversity of stakeholder viewpoints (Strauss and Corbin 1990; Glaser and Strauss 1999). Sample size is therefore determined by the complexity of the subject and the diversity of the relevant population, rather than the numeric size or geographic distribution of the population.

Data for this study were collected through 109 in-depth, one-on-one, loosely guided interviews conducted from August 2004 to June 2007. Most interviews lasted at least 2 h, and several lasted as long as four or more. Interviewees included non-industrial forest owners, industrial forest owners, representatives from Native American tribes, natural resource consultants, policy advisors, state and federal land management agency employees, and members of special interest groups. As is common among persons involved in natural resource management, many of these interviewees had diverse backgrounds with experience in more than one of the above stakeholder groups. Some individuals had experience in as many as five. For example, one individual was a policy advisor and non-industrial private forest owner who was active in a special interest group, and who also had former experience as an agency employee and as an employee of several industrial forest companies. There were many other examples of individuals with strong links to multiple stakeholder groups, such as forest owners who were also policy advisors, agency employees who were also forest owners, forest owners who were also members of special interest groups. The ability of these individuals to understand and interpret a variety of stakeholder perspectives meant they could provide particularly deep and useful insights into the issue and outcomes of forest regulation.

Interviewees were asked to discuss: their roles in natural resource management; overall impressions of the concept of private forest regulation; perceptions regarding public and private roles in relation to private forest protection; impressions of Washington's specific policy instruments; impressions of familiar governmental entities charged with administering policy, and sources of information regarding forest management and protection. Forest owners were additionally asked to discuss their management objectives, successes and challenges in meeting those objectives, and how they perceived the role of their property within the larger ecosystem. The interview data were analyzed using the 'grounded theory' technique

of 'constant comparison', which permits the researcher to continually sort and categorize the data, comparing each successive interview to all previous ones. Clarke's technique of situational mapping provided a helpful supplemental method for visually sorting and organizing the large volume of data. The principal researcher further verified the completeness of the data through field observations of four interdisciplinary reviews of private forest practice proposals in the field, field visits to four additional actively managed private forests and one sawmill, and attendance at two meetings of forest owner organizations and eight meetings of formal policy advisory panels. The principal researcher also reviewed 164 case files of forest practice permits and Alternate Plans issued by the Washington Department of Natural Resources. These field observations and case file reviews provided assurance that no important issues were overlooked in the interview process. As is consistent with 'grounded theory' methodology, new interviewees were sought until no new information or patterns emerged (following Strauss and Corbin 1990; Glaser and Strauss 1999).

Results

Many interviewees described an emerging awareness that regulation affects private forest owners in previously unexpected ways. This was a consistent and central theme in the interview data across all stakeholder groups. In particular, there emerged a strong pattern of examples wherein regulatory impacts were highly dissimilar from one property to another and resulted in comparative advantages and disadvantages among owners. These dissimilarities were a source of frustration for many forest owners, and a matter of escalating concern among many professionals working with them. The experience of many of the interviewees was relatively localized, and the examples each described tended to be clustered within their own personal locale and sphere of experience. As the researcher proceeded through the 'constant comparison' phase of data analysis, however, the cumulative data clearly revealed that this pattern of dissimilar regulatory outcomes among forest properties is pervasive statewide, rather than only an occasional or localized occurrence.

Each example or story about a forest property was analyzed to discover why that property's particular set of regulatory outcomes had occurred. It became apparent that the causes of the inequitable regulatory outcomes fell into three broad categories, namely natural landscape variability, policy design; and variability in landowner goals and circumstances. Each of these categories is described below in greater detail.

Inequitable Consequences Resulting From Natural Landscape Variability

Many regulations are designed to protect specialized habitats or unusually sensitive resources. Because no two properties are alike, the extent to which such a regulation affects a landowner is largely dependent upon the coincidental distribution of that particular resource on the owner's land. Among this group of interviewees the most common examples of this anomaly pertained to the naturally irregular distribution

of critical wildlife or fisheries habitats, and riparian zones. In Washington, these habitats are subject to a network of state and federal regulations that are more complicated, more rigorous and more likely to be inequitable than other particular types of regulations.

Landowners with sensitive species habitats often had to alter substantially their forest practices to provide required protection. By contrast, owners without such species experienced little or no impact from the same regulations. As one consultant explained, 'The last thing most landowners want is to find something like a spotted owl (*Strix occidentalis caurina,* a widely dispersed species requiring a large radius of protected habitat around each nest site). It puts them (the owners) at a real disadvantage compared to their neighbors who don't have threatened or endangered species'.

Restrictions on riparian timber harvest also commonly caused highly variable impacts. (In Washington, approximately 60,000 miles of streams on 10 M ac of non-federal land are affected by regulations restricting timber harvest in riparian zones, as noted by Creighton and Baumgartner 2005, pp. 192–193). Riparian regulations affect only properties with water resources; properties without such resources are essentially unaffected. Furthermore, in Washington the width of the required protected area is determined by a complex matrix of ecological parameters including the size of the riparian resource plus the average mature height of indiginous timber species. Larger streams require a wider protection zone than do smaller streams, and riparian areas where a taller species naturally occurs require a wider protection zone than in a forest type with relatively shorter species.

Regulatory impacts trended upward over time as scientific understanding of a resource improved, especially if social and environmental pressures upon that resource continued to push it toward diminished resilience. This evolution was particularly challenging for forest owners who purchased their land during an earlier, less restrictive regulatory phase and later found they unexpectedly must cope with more restrictive, and often expensive, regulations. One landowner explained, 'These new riparian regulations have just been a nightmare. We're really limited in what we can harvest on our place now, even though my wife's family has been here for generations and we've always managed the place sustainably. We were pretty stunned when we found out about these new regulations'. Then, pointing toward an adjacent, upland property with no riparian resources, he continued, 'Our neighbors have hardly been affected at all, though. They can still pretty much log their whole place. It doesn't seem fair'.

By contrast, forest owners often found it easier to adapt to other forest regulations that affect all properties more equally. Examples included post-harvest stocking levels (e.g. WAC 222-34-010(2)), or the requirement to retain a fixed minimum number of post-harvest wildlife reserve trees (e.g. WAC 222-30-11(b)). These types of rules characteristically 'blanket' an ecosystem evenly, and are less likely to produce stricter or more lenient rules for one forest owner than another. Every owner in the area is subject to the same requirement. As one owner concluded, 'I don't have as much problem with the upland harvest regulations. I wish they weren't so strict, but at least all of us (owners) are in the same boat'.

Inequitable Consequences Resulting From Policy Design

The interviews also revealed that dissimilar outcomes occur among forest owners because of the manner in which individual policies are constructed, or because of the manner in which they do, or do not, interlink with other policies. In some instances policy designers simply overlooked this potential outcome. The unintended regulatory consequences were not apparent until the policy was implemented. For example, policy advisors said they had not intially anticipated a need to consider how forest regulations compare with regulations for other rural land uses such as agriculture. This oversight, however, was producing a new source of inequitable regulatory outcomes because forest owners are required to protect particular ecological parameters much more rigorously than are agricultural, industrial or urban property owners. This inequity was described by many policy advisors, forest owners, forest ownership group representatives and agency employees as an emerging source of concern.

Some interviewees discussed the fact that forest owners with fish-bearing streams are required to design all of their stream-crossing structures to permit easy fish passage. Other types of landowners, as well as city and county governments, are not. This not only created a financial disadvantage for forest owners, it also created the conundrum of inhibiting fish from reaching the protected and more ecologically functional forested riparian habitats because downstream agricultural, industrial and urban landowners were not required to enable fish passage. One exasperated forest owner said, 'I don't mind doing my share of environmental protection. But it sure looks to me like I'm being required to do *more* than my share. What about these other guys (owners of non-forest land that is subject to less strict regulations)?'

Numerous other inconsistencies were indentified. Some forest owners and consultants claimed that such regulatory discrepancies can sway landowners to de-emphasize forestry in favour of other land uses. Some told stories of forest owners who had decided to stop growing mature, biodiverse forest in favour of monocultural crops of Christmas trees. By converting to a Christmas tree crop, their forest land could be-rezoned as agricultural land and therefore subject to the much less restrictive agriculture regulations and more favourable tax base. Other interviewees told of forest owners who had substantially thinned their forest overstory to favour understory vegetation, thus increasing their capacity to graze livestock and gain an agricultural zoning classification. A full assessment of the scope of this phenomenon is beyond the scope of this study, but the interview data indicates this is a topic worthy of further study.

Some interviewees perceived the likelihood of inequitable regulatory consequences, but believed the merits of a particular policy outweighed this problem. They believed negative social consequences should be handled through mitigation strategies rather than a policy revision. In particular, some believed the presence of a threatened or endangered species implies such a need for urgency that ecological requirements should appropriately take precedence. They preferred to see any social inequities alleviated through some form of special assistance to individual affected landowners such as governmental subsidies to cover the financial costs of habitat improvement and protection, leaving the 'teeth' of the regulation intact.

Some policy advisors and administrators believed forest owners bear an unreasonable share of the social burden of environmental protection. However, others defended the forest regulations, saying that although regulatory equity was important, it was also important to ensure ecological protection where possible. 'The fact that we can't protect an entire ecosystem doesn't mean that we shouldn't protect the parts that we can', said one. Another said 'Urban areas are already a loss, and the agricultural lobby is so powerful that we can't do much to improve biodiversity on farms. If we don't focus on protecting forests, we won't have anything left at all'.

Inequitable Consequences Linked to Forest Owner Goals

Simply put, the manner in which a forest owner is affected by a regulation depends in part upon the forest owner's management goals. For example, in the State of Washington, forest owners must sign a 'non-conversion' moratorium before undertaking a timber harvest. The owner must agree to refrain from selling or converting their property to any use not associated with timber growing for 6 years after the harvest. Some owners said they were not materially affected by this rule because they had no desire to sell their land. Others, however, felt the effects of the moratorium keenly because it constrained them from using their land for other purposes that they wished to prioritize over growing timber.

The most common other examples related to regulations restricting timber harvest. Some forest owners said the regulations had greatly reduced the profitability of their land by forcing them to substantially change the way they used their timber, and some were greatly resentful of such regulations. By contrast, others said the same regulations required only minimal changes to their accustomed field practices and that their primary negative outcome was the new expense of the required plans and permits. Still others who had no intention of actively managing or harvesting their timber said they experienced little or no impact from harvest regulations.

The State's requirements for detailed and relatively sophisticated planning documents and project permits were another source of inequities among forest owners. The necessary permits and plans typically require professional expertise. They have the desirable outcome of helping ensure that standards of environmental protection are met, but also a negative outcome of making the process of forest management less accessible for some forest owners than for others. Among these interviewees, it was clear that such requirements favour industrial forest owners who typically have professionals on staff, and those non-industrial forest owners with professional resource management backgrounds or the financial ability to hire consultants. The requirements also favour owners with larger properties with inherently larger-scale projects that can generate commensurately higher profit margins from timber harvest to cover planning costs, thus giving the forest owner enough residual profit to justify the expense. By contrast, the economies of scale are typically much less favourable for small non-industrial forest owners. Many among the non-industrial group complained that the state's required plans consumed a large

proportion of their potential profit, particularly where projects required specialized attention and documentation.

Foresters employed by the state regulatory agencies will sometimes guide a forest owner who cannot afford a consultant, but the intent of most of the regulatory programs is that the forest owner, not the government, is responsible for preparing the pertinent applications and reports for any forest practices they wish to undertake. As one agency leader said, 'We're charged with managing resources for the interests of the entire public. If we single out some owners for special assistance, we're being unfair to the others. Consequently, forest owners without consultants often felt daunted by the State's permit requirements. Many interviewees warned that this unanticipated problem is deterring some forest owners from undertaking environmentally beneficial forest restoration projects to maintain or improve forest health and habitat quality. Such projects are often expensive to design, and they frequently produce insufficient income from extracted resources or no income at all to offset professional consulting costs.

Discussion

In that all inequitable outcomes cannot be prevented, it may often be appropriate to mitigate them when they occur. Policy-makers should expect that each of the three causes of inequitable regulatory outcomes will present a different set of challenges in terms of finding solutions:

Solution Pathways for Inequitable Consequences Arising From Natural Landscape Variability

Landscape variability is fundamental to any natural environment. Forest policy cannot 'design it away'. The challenge, then, is to disperse fairly the rights and responsibilities associated with protecting a highly variable forest ecosystem among the affected public and private stakeholders (Ostermeier and Keele 2003). To accomplish this, policy-makers must avoid allowing the regulatory process to inadvertently favour some landowners by regulating them less strictly, or conversely require a disproportionate contribution from others who own properties with more sensitive and hence more closely regulated resources (Meltz et al. 1999).

A policy protecting a resource that naturally occurs unevenly across a landscape—such as endangered species or riparian habitats—will never affect all owners equally, simply because such resources do not and cannot occur similarly from one property to another. Consequently, when dealing with these types of resources, policy-makers are likely to be limited to 'back-end', post-regulatory mitigation strategies, scaled to the individual or small-group level, and focused toward the subset of forest owners who are disproportionately affected.

An array of existing policy instruments can be readily adapted as solutions. These include cost-sharing programs, conservation easement payments, stewardship recognition programs, and fee or regulation waivers for landowners who are proactive about environmental protection. Many of these instruments were

originally developed as 'incentives' to encourage improved stewardship in locales where conservation efforts are not mandatory. They are just as applicable to the task of reducing disproportionate or inequitable impacts where conservation is compulsory (i.e. regulated). These strategies spread the responsibility for conservation more uniformly between the landowner and the public, and can mitigate particular unequal costs or burdens associated with environmental protection.

Solution Pathways for Inequitable Consequences Arising From Policy Design

Here the potential array of solutions is more fluid and varied, because policy-makers may work from the 'front-end' of the policy design process, as well as from its 'back-end' phases of implementation or mitigation. The source of the problem—policy design—is also the source of the solution. Policy design flaws can be 'designed away'. In some cases, an entire policy structure can be reworked to better 'fit' its desired environmental and social outcomes. It can also be 'scaled' to better accommodate consideration of outcomes at the individual owner level. Elements of 'vertical interplay', such as linkages between inter-related federal and state policies, and 'horizontal interplay', such as disparities in environmental protection standards between land-use zoning designations, may be brought into greater harmony as needed (Young 2002).

The fact that policy-makers have here a larger pool of solutions does not, however, imply that the task is easier. Policy-makers and stakeholders alike may be reluctant to undertake a revision—policy-makers because of the complexity and public expense of the process, and stakeholders because they are wary that potential changes may not support their interests. Policy analysts contend it is sometimes easier to attach a mitigation or 'stopgap' measure to a policy rather than develop the 'collaborative capacity' (Weber et al. 2005) required to fundamentally restructure the policy itself. Policy-makers thus often make a strategic decision to avoid a full-scale policy remediation (Fiorino 1995).

A number of the more experienced policy advisors interviewed in this study advocated the mitigation approach because it can be applied on a case-by-case basis, providing relief to disproportionately affected forest owners without reducing overall environmental protection. This can, however, add yet another layer of complexity to a regulatory structure. Mitigation measures focused at the case-by-case landowner level create an additional and costly administrative workload. Nonetheless, they can often provide the most easily implemented solution for retrofitting a policy, providing improved social outcomes without reducing the ecological rigour of the overarching law.

Solution Pathways for Inequitable Outcomes Arising From Dissimilar Landowner Goals

Not all forest owners will experience effects from a regulation, if that regulation does not interfere with their prior interests or management objectives. The affected subset of landowners can be expected to differ with each type of regulatory policy. The group affected by a riparian policy may be quite different from the group affected by

a policy pertaining to an upland wildlife species, for example. Policy-makers therefore need only focus on a subset of forest owners—those whose management objectives are disproportionately restricted by the particular regulation. The fact that policy-makers will rarely need to provide mitigation measures for the total number of landowners helps reduce the scope and complexity of strategies necessary for dealing with inequitable regulatory outcomes from any particular regulation.

Conversely if policy-makers fail to recognize the subset of forest owners genuinely needing relief, the oversight may contribute to a variety of undesirable consequences. As one high-ranking agency employee cautioned, 'This type of error can lead to a whole array of 'perverse incentives', like discouraged forest owners, non-compliance with regulations, and more willingness to sell or convert forestlands'. It is helpful that policy-makers can rely on policy tools similar to those that can be used where disproportionate outcomes are due to landscape variability or oversights in policy design. Here again, familiar strategies such as conservation easements, cost-sharing or opportunities for alternative management prescriptions can be adapted to mitigate problematic social outcomes.

There is substantial overlap between these three primary causes of inequitable regulatory outcomes among forest owners. Their combined effects may produce an almost infinite variety of scenarios. For example, endangered species regulations may substantially constrain a variety of management activities, but if a property owner is a wildlife enthusiast that outcome may be viewed as a welcome opportunity to benefit wildlife rather than as a restriction. By contrast, a tree farmer who relies upon sustainable resource extraction as a livelihood and whose healthy forest has attracted sensitive species may be greatly encumbered by the same regulation. The challenge for policy-makers is to identify the subsets of landowners who may be experiencing a genuinely disproportionate burden as a result of regulation, and then tailor remedial strategies that improve social equitability while still adequately protecting the ecosystem.

Conclusions and Policy Implications

An important finding of this study is that many types of forest regulations result in a substantially unequal distribution of regulatory impacts among forest owners. Even well-designed policies may produce unequal outcomes due to landscape variability or the personal circumstances of the landowners. Policy-makers seeking a socially equitable outcome need to anticipate and be prepared to mitigate this problem. There is no reason to believe that this situation is peculiar to the State of Washington. It is just as likely to occur in other locales simply because primary causes of the problem—landscape variability, complexities of policy design, and dissimilar circumstances among individual land ownerships—are generic, rather than particular to any specific setting. *This does not imply that the regulation of private forests is inherently indefensible or untenable.* It is worth noting that virtually every interviewee in this study supported the overarching concept of regulation. Many described the need for regulation as regrettable, but most nonetheless considered it a necessary, albeit challenging, part of any strategy for

achieving long-term forest health and sustainability. Their debate was not about whether to regulate, but how.

It should also be noted, however, that this relatively high level of willingness to accept the regulation of private forests does not necessarily reflect a global consensus, nor even a national consensus with the USA. As touched upon in prior sections of this paper, within the USA the question of whether or how to regulate private forest practices is largely left to the discretion of the individual states. Some states, Washington included, have regulated private forests intensively for decades, while others employ substantially less comprehensive regulatory programs. Still others do not regulate forests at all. In particular regions of the USA, as well as other regions around the world, social resistance to private forest regulation remains both strong and widespread, whereas in other regions the concept of forest regulation is broadly accepted and firmly established in the local social and political culture.

Implications for Policy-Makers

First, as the trend toward increasing regulation of private forests continues, it is ecologically and politically risky to ignore the problem of unequal regulatory outcomes among forest owners. Private ownerships control a majority of the forests in the United States and around the globe. They have substantial cumulative influence over ecological outcomes. If policy-makers fail to recognize and mitigate disproportionate regulatory impacts among forest owners, there is reason to expect a growing incidence of unintended negative ecological, social and political consequences. These include unwillingness on the part of disaffected landowners to provide publicly desired levels of ecological protection, and reduced support for the concept of public intervention in private resource management.

Second, if mitigation strategies are to be effective, they must be *user-friendly*. Programs requiring complicated application processes or documentation beyond the financial or other capabilities of the average forest owner provide few real solutions. Indeed, such requirements actually add to the problem of inequitable regulatory outcomes rather than alleviating it, because they place the mitigation opportunities within reach of only a relatively privileged few of the legitimately eligible landowners. Policy-makers may find it advisable to provide for governmental support in order to make a mitigation program more equally accessible to all.

Third, even when employing a relatively familiar and tested policy tool such as a conservation easement, policy-makers may need to incorporate some means of filtering out illegitimate users. Some types of mitigation programs can be vulnerable to applicants who apply for public compensation to 'refrain' from management activities they would never have actually undertaken. An appropriate filtering technique could be as simple as a requiring all applicants to present a business plan or stewardship plan documenting the landowner's prior intent and interest in actively managing that resource. In the USA, funds for stewardship planning are widely available to forest owners through governmental programs. Consequently, a requirement for this particular type of proof of intent would be unlikely to create an

unreasonable or unequal burden for any owner, yet could serve as a means of deterring frivolous claims and substantiating legitimate ones.

Fourth, fiscal compensation to landowners is likely to be an important mitigation tool simply because so many regulatory outcomes cause landowners to incur opportunity costs. Compensatory payment is not, however, the only effective mitigation strategy. In some situations other alternatives may suit, and present the significant advantage of reducing taxpayer costs. Potential models include Washington's Alternate Plan option and Idaho's regulatory waiver option which allow landowners to vary from established regulations and develop site-appropriate, innovative, yet still environmentally responsible resource management strategies. Less tangible incentives such as programs publicly honouring good stewardship could also be effective.

Lastly, ecologically sustainable forests can best be achieved through socially sustainable policies. Forest owners are a policy-maker's most potentially efficient and logical allies for achieving sustainable environmental stewardship on private forests. Consequently, creating policies responsive to the circumstances of forest owners may in many ways be as relevant as creating policies responsive to the conditions of the forests.

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